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a deceleration stage positioned downstream of said analyzer for decelerating said ion beam from said first transport energy to a final energy lower than said first transport energy;

a beam filter comprising a magnet positioned downstream of said deceleration stage for separating neutral particles from said ion beam; and

a target site for supporting a target for ion implantation, wherein said ion beam is transported through said beam filter and is delivered to said target site at said final energy.

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15. (As Amended) An ion implanter comprising:

an ion source for generating an ion beam at a first voltage  $V_0$ ;

an analyzer for separating unwanted components from said ion beam;

a first beam transport device for transporting said ion beam through said analyzer at a first transport energy;

a first deceleration stage positioned downstream of said analyzer for decelerating said ion beam from said first transport energy to a second transport energy less than said first transport energy;

a beam filter positioned downstream of said first deceleration stage for separating neutral particles from said ion beam;

a second beam transport device for transporting said ion beam through said beam filter at said second transport energy;

a second deceleration stage positioned downstream of said beam filter for decelerating said ion beam from said second transport energy to a final energy less than said second transport energy; and

a target site for supporting a target for ion implantation, wherein said ion beam is delivered to said target site at said final energy.

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A<sup>3</sup>

30. (As Amended) A method for implanting ions in a target, comprising the steps of:

generating an ion beam at a first voltage  $V_0$ ;

separating unwanted components from said ion beam in an analyzer;

transporting said ion beam through said analyzer at a first transport energy;

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decelerating said ion beam from said first transport energy to a final energy lower than said first transport energy downstream of said analyzer;

separating neutral particles from said ion beam in a beam filter comprising a magnet, after decelerating said ion beam from said first transport energy to said final energy; and

delivering said ion beam to a target site at said final energy.

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37. (As Amended) A method for implanting ions in a target, comprising the steps of:

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generating an ion beam at a first voltage  $V_0$ ;

separating unwanted components from said ion beam in an analyzer;

transporting said ion beam through said analyzer at a first transport energy;

decelerating said ion beam from said first transport energy to a second transport energy less than said first transport energy in a first deceleration stage positioned downstream of said analyzer;

separating neutral particles from said ion beam in a beam filter positioned downstream of said first deceleration stage;

transporting said ion beam through said beam filter at said second transport energy;

decelerating said ion beam from said second transport energy to a final energy less than said second transport energy in a second deceleration stage positioned downstream of said beam filter; and

delivering said ion beam to a target site at said final energy.

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45. (As Amended) An ion implanter comprising:

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an ion source for generating an ion beam and accelerating said ion beam at a first voltage  $V_0$ ;

a beamline module containing one or more beamline components for modifying said ion beam;

means for transporting said ion beam through said beamline module at a first transport energy;

a beam filter positioned downstream of said beamline module for separating neutral particles from said ion beam;

A5 a deceleration stage disposed between said beamline module and said beam filter for decelerating said ion beam from said second transport energy to a final energy less than said first transport energy; and

a target site for mounting a target for ion implantation, wherein said ion beam is transported through said beam filter and is delivered to said target site at said final energy.

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52. (As Amended) An ion implanter comprising:

an ion source for generating an ion beam and accelerating said ion beam at a first voltage  $V_0$ ;

an analyzer for separating unwanted components from said ion beam;

A6 a first beamline module containing one or more beamline components for modifying said ion beam;

first means for transporting said ion beam through said first beamline module at a first transport energy;

a second beamline module positioned downstream of said first beamline module, said second beamline module comprising a beam filter for separating neutral particles from said ion beam;

a first deceleration stage disposed between said first and second beamline modules for decelerating said ion beam from said first transport energy to a second transport energy less than said first transport energy;

second means for transporting said ion beam through said second beamline module at said second transport energy;

a target site positioned downstream of said second beamline module for mounting a target for ion implantation; and

a second deceleration stage disposed between said second beamline module and said target site for decelerating said ion beam from said second

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transport energy to a final energy less than said second transport energy, wherein said ion beam is delivered to the target site at said final energy.

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